LIST OF CONTENTS

NUMBER 1

A. Frezzotti and R. Pavani 1 Direct numerical solution of the Boltzmann equation on a parallel computer H. Zhang, M. Reggio, 9 Discrete form of the GCL for moving meshes and its J. Y. Trépanier and implementation in CFD schemes R. Camarero D. Ma, A. H. Eraslan and 25 A computer code for analyzing transient three-G. Ahmadi dimensional rapid granular flows in complex geometries Wei Shyy and 51 Development of a pressure-correction/ staggered-grid Chia-Sheng Sun based multigrid solver for incompressible recirculating flows Technical Note J. J. McGuirk and 77 The efficiency of alternative pressure-corrrection J. M. L. M. Palma formulations for incompressible turbulent flow problems 89 Corrigenda I Software Survey Section SIAMM-FLUID; Fieldview

NUMBER 2/3

V Announcements

FOURTH INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL FLUID DYNAMICS

Harry A. Dwyer	v	Preface and Memorial
K. W. Morton, P. I. Crumpton and J. A. Mackenzie	91	Cell vertex methods for inviscid and viscous flows
Günter H. Schnerr	103	Transonic aerodynamics including strong effects from heat addition
David A. Caughey	117	Implicit multigrid techniques for compressible flows
Y. Tamura and K. Fujii	125	A multi-dimensional upwind scheme for the Euler equations on structured grids
Moshe Rosenfeld	139	Validation of numerical simulation of incompressible pulsatile flow in a constricted channel
Moshe Rosenfeld	139	

H. M. Wu, M. L. Yang, C. Q. Hu and K. Oshima	157	FUM—an efficient MmB solver for steady inviscid flows
J. Y. Yang and Chiang-An Hsu	163	Numerical experiments with nonoscillatory schemes using Eulerian and new Lagrangian formulations
Yasuhiro Wada, Satoru Ogawa and Hirotoshi Kubota	179	Thermo-chemical models for hypersonic flows
Lan Chieh Huang, Ya-Dan Wu and Jian-Xiong Shen	189	The explicit-implicit projection method in local mesh refinement for natural convection flow
Song Fu	199	Modelling of the pressure-velocity correlation in turbulence diffusion
Andi Eka Sakya, Yoshiaki Nakamura and Michiru Yasuhara	207	Evaluation of an RNG-based algebraic turbulence model
H. Deconinck, P. L. Roe and R. Struijs	215	A multidimensional generalization of Roe's flux difference splitter for the Euler equations
Hiroshi Takeda, Kunio Narasaki, Hideki Kitajima, Seiichi Sudoh, Mitsuo Onofusa and Seiya Iguchi	223	Numerical simulation of mixing flows in agitated vessels with impellers and baffles
M. Breuer, D. Hänel, J. Klöker and M. Meinke	229	Computation of unsteady vortical flows
Max D. Gunzburger, L. Steven Hou and Thomas P. Svobodny	239	The approximation of boundary control problems for fluid flows with an application to control by heating and cooling
Takashi Abe	253	Generalized scheme of the no-time-counter scheme for the DSMC in rarefied gas flow analysis
S. Yamamoto and H. Daiguji	259	Higher-order-accurate upwind schemes for solving the compressible Euler and Navier-Stokes equations
Todd J. Mitty, Antony Jameson and Timothy J. Baker	271	Solution of three-dimensional supersonic flowfields via adapting unstructured meshes
U. Riedel, U. Maas and J. Warnatz	285	Simulation of nonequilibrium hypersonic flows
Albrecht Eberle and Stefan Heiss	295	Enhanced numerical inviscid and viscous fluxes for cell centered finite volume schemes
Kenichi Matsuno	311	Improvement and assessment of an arbitrary-high- order time-accurate algorithm

323 Comparison of numerical methods in transonic P. R. Garabedian aerodynamics R. A. Platfoot and 327 Multiple sweep solutions of gas flow in arbitrary ducts C. A. J. Fletcher The engineering of multiblock/multigrid software for Arthur Rizzi, Peter Eliasson, 341 Ingemar Lindblad, Navier-Stokes flows on structured meshes Charles Hirsch, Chris Lacor and Jochem Haeuser F. Sabetta, B. Favini and 369 Equilibrium and nonequilibrium modeling of hyper-M. Onofri sonic inviscid flows K. Khalfallah, G. Lacombe 381 Analysis of implicit treatments for a centred Euler and A. Lerat solver NUMBER 4/5 **EGON KRAUSE HONOUR ISSUE**

Preface		
W. Kordulla and C. H. Liu	vii	Enhanced physical understanding of fluid mechanics through a combination of computation and experiment
C. Weiland, W. Schröder and S. Menne	407	An extended insight into hypersonic flow phenomena using numerical methods
G. Brenner, T. Gerhold, K. Hannemann and D. Rues	427	Numerical simulation of shock/shock and shock-wave/boundary-layer interactions in hypersonic flows
Jörn Sesterhenn, Bernhard Müller and Hans Thomann	441	Flux-vector splitting for compressible low Mach number flow
A. Mofid and R. Peyret	453	Stability of the Chebyshev collocation approximation to the advection-diffusion equation
M. Breuer and D. Hänel	467	A dual time-stepping method for 3-D, viscous, incompressible vortex flows
R. Vilsmeier and D. Hänel	485	Adaptive methods on unstructured grids for Euler and Navier-Stokes equations
M. Fey, R. Jeltsch and S. Müller	501	Stagnation point computations of nonequilibrium inviscid blunt body flow
Hyun Dae Kim and Nan-Suey Liu	517	A time-accurate high-resolution TVD scheme for solving the Navier-Stokes equations
Chee Tung, Kenneth W. McAlister and Clin M. Wang	529	Unsteady aerodynamic behavior of an airfoil with and without a slat

Pavel B. Bochev and Max D. Gunzburger	549	Accuracy of least-squares methods for the Navier-Stokes equations
L. Ting and F. Bauer	565	Viscous vortices in two- and three-dimensional space
Katsuya Ishii, Kunio Kuwahara and C. H. Liu	589	Navier-Stokes calculations for vortex rings in an unbounded domain
C. H. Liu, O. A. Kandil and H. A. Kandil	607	Numerical simulation and physical aspects of super- sonic vortex breakdown
Ken Naitoh, Yasuo Takagi and Kunio Kuwahara	623	Cycle-resolved computation of compressible turbu- lence and premixed flame in an engine
U. R. Müller and H. Henke	649	Computation of subsonic viscous and transonic viscous-inviscid unsteady flow
H. S. Pordal, P. K. Khosla and S. G. Rubin	663	Pressure flux-split viscous solutions for swirl diffusers
		NUMBER 6
Arkady S. Dvinsky and John K. Dukowicz	685	Null-space-free methods for the incompressible Navier-Stokes equations on non-staggered curvilin- ear grids
Raos Riad Mossad	697	Finite element solution of nonsteady incompressible viscous flow between two rotating concentric spheres
Gerald Gaboury and William Garland	713	A numerical flow simulation based on the rate form of the equation of state
B. Ramaswamy	725	Theory and implementation of a semi-implicit finite element method for viscous incompressible flow
	- 1	Software Survey Section
	٧	Announcements

AUTHOR INDEX

Abe T., 253 Ahmadi G., 25

Baker T. J., 271 Bauer F., 565 Bochev P. B., 549 Brenner G., 427 Breuer M., 229, 467

Camarero R., 9 Caughey D. A., 117 Crumpton P. I., 91

Daiguji H., 259 Deconinck H., 215 Dukowicz J. K., 685 Dvinsky A. S., 685

Eberle A., 295 Eliasson P., 341 Eraslan A. H., 25

Favini B., 369 Fey M., 501 Fletcher C. A. J., 327 Frezzotti A., 1 Fu S., 199 Fujii K., 125

Gaboury G., 713 Garabedian P. R., 323 Garland W., 713 Gerhold T., 427 Gunzburger M. D., 239, 549

Haeuser J., 341 Hänel D., 229, 467, 485 Hannemann K., 427 Heiss S., 295 Henke H., 649 Hirsch C., 341 Hou L. S., 239 Hsu C.-A., 163 Hu C. Q., 157 Huang L. C., 189

Iguchi S., 223 Ishii K., 589 Jameson A., 271 Jeltsch R., 501 Jian-Xiong Shen, 189

Kandil H. A., 607 Kandil O. A., 607 Khalfallah K., 381 Khosla P. K., 663 Kim H. D., 517 Kitajima H., 223 Klöker J., 229 Kubota H., 179 Kuwahara K., 589, 623

Lacombe G., 381 Lacor C., 341 Lerat A., 381 Lindblad I., 341 Liu C. H., 589, 607 Liu N.-S., 517

Ma D., 25
Maas U., 285
Mackenzie J. A., 91
Matsuno K., 311
McAlister K. W., 529
McGuirk J. J., 77
Meinke M., 229
Menne S., 407
Mitty T. J., 271
Mofid A., 453
Morton K. W., 91
Mossad R. R., 697
Müller B., 441
Müller S., 501
Müller U. R., 649

Naitoh K., 623 Nakamura Y., 207 Narasaki K., 223

Ogawa S., 179 Onofri M., 369 Onofusa M., 223 Oshima K., 157

Palma J. M. L. M., 77 Pavani R., 1 Peyret R., 453 Platfoot R. A., 327 Pordal, H. S., 663

Ramaswamy B., 725 Reggio M., 9 Riedel U., 285 Rizzi A., 341 Roe P. L., 215 Rosenfeld M., 139 Rubin S. G., 663 Rues D., 427

Sabetta F., 369 Sakya A. E., 207 Schnerr G. H., 103 Schröder W., 407 Sesterhenn J., 441 Shen J.-X., 189 Shyy W., 51 Struijs R., 215 Sudoh S., 223 Sun C.-S., 51 Svobodny T. P., 239

Takagi Y., 623 Takeda H., 223 Tamura Y., 125 Thomann H., 441 Ting L., 565 Trépanier J. Y., 9 Tung, C., 529

Vilsmeier R., 485

Wada Y., 179 Wang C. M., 529 Warnatz J., 285 Weiland C., 407 Wu H. M., 157 Wu Y.-D., 189

Yamamoto S., 259 Yang J. Y., 163 Yang M. L., 157 Yasuhara M., 207

Zhang H., 9

